navigation of the estuary of the Ob is better known, the voyage may be made in even a shorter time. Indeed if depôts were established at suitable points on the north Norwegian coast, it might be possible for a ship to make two journeys to Siberia in one summer. Probably the Ob is the most important of the Siberian rivers so far as commerce is concerned. Trade on the Ob is already considerably developed, the river being navigated by over thirty steamers. The region around the river is the most productive and most thickly inhabited in Siberia.

IN an article in the September number of Petermann's *Mittheilungen*, on the chief branches of the Russians, much interesting information is given on the characteristics and distribution of the Great, Little, and White Russians, illustrated by a carefully constructed map. In the same number Dr. Junker, in a letter to Dr. G. Schweinfurth, describes his travels in the south-west part of the Nile Region in January-October, 1877, adding considerably to our knowledge of the region, and making several corrections on existing maps. Lieut. Weyprecht describes the results of his observations in 1871-4, on the temperature and depth of the sea to the east of Spitzbergen. The sea, he finds, is comparatively shallow, seldom exceeding 400 metres.

WE have received a handsome atlas of the State of New Hampshire (U.S.), containing, besides a series of beautifully-executed maps of the state and of its counties, —meteorological, geological, agricultural, and arboricultural,—a vast amount of well-arranged information on its topography, geography, river systems, climatology, railroads, educational institutions, agricultural and botanical productions, mechanical and manufacturing interests, &c. The work is edited by Mr. H. F. Walling, C.E., and Prof. C. H. Hitchcock, and is published by Comstock and Clive, New York. The work is creditable both to the editors and publishers. The long list of "patrons" of the atlas appended—mostly people in business—speaks well for the intelligence of the inhabitants of New Hampshire.

IN a letter to Sir Samuel Baker from a gentleman in the Khedive's service, the latter describes a successful journey which had been made with some Indian elephants in the White Nile region, proving that this powerful and useful animal may be utilised advantageously in African travel and exploration.

## *OUR ASTRONOMICAL COLUMN*

THE INTRA-MERCURIAL PLANET.—In addition to the letter addressed to the Astronomer-Royal by Prof. James Watson, after revising his first position of the object near $\theta$ Cancri, more carefully at Ann Arbor, similar communications have been made to M. Fizeau (*Comptes Rendus*, May 2), Prof. Förster (*Circular zum Berliner Astronomischen Jahrbuch*, No. 98), and to Prof. Peters (*Astronomische Nachrichten*, No. 2,217). The definite position is in R.A. 8h. 27m. 24s., Decl. + 18° 16′ for July 29, at 5h. 16m. 37s. Washington M.T., or 10h. 24m. 49s. M.T. at Greenwich, which position Prof. Watson considers to be trustworthy within five minutes of arc, with a greater probable error in the declination than in the right ascension. The other points named by the discoverer, upon which stress is to be laid, are the fact of the star $\theta$ Cancri being also observed, the appearance of a sensible disk with a power of 45 on a 4½-inch refractor, its ruddy colour and much greater brightness than that of the neighbouring star. There has never been a suspicion of a variable star in this vicinity, nor can the appearance of a disc be so explained. Prof. Watson seems to have satisfied himself that the object was not a comet; indeed, such a body would hardly appear round and well-defined with the sun totally eclipsed. In the case of the comet of March 1847, which was observed in full daylight, at a similar distance from the sun to that of Prof. Watson's object, two short tails were visible though the head was circular, and the great comet of February, 1843, also exhibited a bifid tail, which was bright and distinct to the naked eye. Mr. Hartnup, who observed the comet of Klinkerfues, 1853, in broad daylight, described it as circular, well-defined, and without tail, but the case is hardly analogous to that of a comet viewed while the sun is wholly hidden.

[Since the above was in type, the full details of Prof. Watson's observations and reductions have been received.]

THE VARIABLE NEBULA IN TAURUS (HIND, 1852).—In the diagram attached to M. Tempel's remarks upon this object in *Astron. Nach.*, No. 2,212, a distinction is made between the position given in No. 839 of the same periodical and that assigned with reference to the neighbouring variable star T Tauri. To prevent misconception on this point it may be well to remark that, on the first night the nebula was perceived with Mr. Bishop's seven-inch equatorial—October 11, 1852—it preceded the variable star 1s.·2, and was south of it 0″·7, as stated in the *Astron. Nach.*, and that at no subsequent time when the nebula was observed with the same instrument was any difference of position noticed: it appeared to nearly touch the star on the S.P. side. No. 1 on M. Tempel's diagram should be therefore erased. In a note in his Supplementary Catalogue Mr. Dreyer states that he found no appearance of nebulosity near the well-known variable; nor did Dr. Copeland, observing with the large refractor at Lord Lindsay's Observatory; nor M. Tempel, with a fine Amici of 11-in. aperture, at Arcetri. On the other hand, M. Otto Struve still found traces of nebulosity with the Pulkova instrument, which he "believes is certainly the variable nebula itself, only in altered brightness and spread over a larger space;" and he adds, "some traces of nebulosity are still to be seen exactly on the spot where Hind and d'Arrest placed the variable nebula." The accurate position of T Tauri has yet to be determined by meridional observation. Argelander re-observed Bessel's star of the ninth magnitude, which precedes it 16·5s., about 4′ south.

THE LATE DR. E. VON ASTEN.—By the early death of Dr. von Asten astronomy has lost a most able worker in a branch which has numbered of late years fewer distinguished names than formerly. He was one of Argelander's pupils and intended to apply himself to observations, but, we believe, through a serious accident, he was incapacitated for active occupation, and his desire to devote his attention to astronomy could only be gratified by obtaining employment in calculation. This he was so fortunate as to effect through the director of the Imperial Observatory at Pulkova, M. Otto Struve, who engaged him as one of the staff of computers. In this position Dr. von Asten had for some time carried on a rigorous investigation on the motions of Encke's comet, one of the most interesting results of which has been to prove that while in some revolutions an acceleration similar to that attributed by Encke to the existence of a resisting medium has made itself evident; in others the motion of the comet could be precisely followed without such hypothesis, and hence a different cause might be found for the cases of acceleration. Dr. von Asten previous to his connection with Pulkova, minutely discussed the whole of the observations of the great comet of Donati (1858 vi.), arriving at the conclusion that at the time it was visible it was moving in an elliptical orbit with a period of nearly 1,900 years.

## *NOTES*

THE Association of German Naturalists and Physicians commenced its sittings at Cassel on Wednesday last week, and judging from the numbers of the *Tageblatt* and of the Cassel papers that have been sent us, the meeting has been quite as

successful as usual. Every provision had been made by the local authorities for the reception of the Association, and while abundance of serious work has been done, a fair proportion of the time has been given to enjoyment. Among the arrangements, for example, are performances of "Faust," "Midsummer's Night's Dream," "Comedy of Errors," "Tannhäuser," and other classical pieces in the theatre, and among the excursions is one to the Paris Exhibition. The president, Dr. Stilling, in his opening address, traced the history of the scientific life of Cassel, showing that much good work had been done there, and that the names of not a few eminent men of science have been connected with the city. The title of Prof. Oscar Schmidt's lecture seems sensational enough—"Darwinism and Social Democracy,"—but his treatment of it seems to have been quiet enough; he aimed at showing that Darwinism instead of being a leveller, showed the tendency to be everywhere to heterogeneity. Prof. Hueter, in his lecture on the Physician in Relation to Research and Natural Science advocated a longer curriculum for medical students and a more thorough training in science and in the experimental method. The numerous sections were busy enough, and many good papers were read, but any further account of the proceedings we reserve till we have received a complete set of the *Tageblatt*.

IN the terrible panic which has seized the Southern States under the epidemic of yellow fever, we are glad to see that science has been pressed into service and stuck bravely to her post. Every one who can is flying for life, but it has been deemed advisable to retain the sergeants of the United States Signal Service at their posts in order to keep up for the use of the medical men regular observations of temperature, humidity, and other atmospheric phenomena which may have any influence in the spread of the disease. One of these officers died at his post and two others had been struck down, probably also fatally, as we learn from the New York *Tribune*. It is encouraging to see that the United States authorities have kept their heads clear enough to perceive that the services of science are indispensable to "the healing of the nations."

M. BISCHOFSHEIM, the well-known Parisian banker, has sent a sum of 10,000 francs to the French Bureau Central Météorologique to help in the construction of the intended Mont Ventoux Observatory. We may remind our readers that he, at the suggestion of his friend M. Leverrier, helped in the same manner the construction of the Puy-de-Dôme and Pic-du-Midi establishment. M. Bischofsheim has also agreed to pay M. Eichens 1,000*l*. to complete within a year the construction of the great refractor begun in Leverrier's time in 1870.

THE fitting up of the Lyons Observatory is progressing favourably; the inauguration will take place in a few weeks.

WE noticed with regret a few weeks ago that a tax had been imposed on the French communes to entitle them to receive the daily meteorological telegrams of the Bureau Central. A new delay has been granted for the subscription, and we are happy to state that a large number of rural parishes, fully appreciating the importance of the service rendered by the telegraphic warnings, have already agreed to pay the yearly charge, which has been reduced to forty francs.

M. COCHERY, the director of the French postal telegraph, is now in London studying the working of the English system and hopes to introduce into the French service a number of improvements which the large traffic and progressive character of he English service has brought into use.

THE meeting of the Iron and Steel Institute opened at Paris on Monday, with a presidential address by Dr. C. W. Siemens, who showed how comparatively well provided France is with institutions for scientific education, and referred briefly to the work carried on at some of the great industrial centres. We have already given a list of the papers to be read, all of them of more or less technical bearing.

THE fourth Congress of Orientalists commenced its sittings this year at Florence on the 12th inst. The chief nationalities have been well represented, and the reception by Florence and by Prince Amadeo has been hearty. One attractive feature is an extensive exhibition of objects connected with the subjects with which the Congress deals.

THE Fourth Annual Conference of the Cryptogamic Society of Scotland, will be held at Edinburgh on October 9, 10, and 11. The programme includes excursions, a dinner, and an exhibition of fungi. The meeting-place is the Botanic Gardens of Edinburgh, the president is Prof. Balfour, and the secretary Dr. Buchanan White, Perth.

AN agricultural exhibition took place at Lockwitz, near Dresden, on September 5–7. It formed part of the general meeting of the Saxon Agricultural Society which enjoys the special patronage of the King of Saxony.

THE Congress for 1878 of the German Viticultural Society was held at Würzburg on September 15–19.

GREAT activity continues to be manifest in Vesuvius, and volumes of lava are projected to a height of 100 yards above the new crater, accompanied by loud explosions. However, no flames are yet visible.

SINCE M. du Moncel presented the Edison phonograph to the Academy of Sciences electrical inventions of every description are sent to him for presentation. A large number of these deserve notice, and no sitting passes without M. du Moncel speaking on two or three different inventions. This state of things has created some anxiety amongst members unable to understand electrical matters. On Monday week one of them proposed to the president that M. du Moncel be obliged to execute all the experiments he was describing before the Academy, in order to prove whether they were sound. M. du Moncel replied that he was himself verifying them with much care, but that a number could not be executed before the learned assembly, as two different stations, situated at a great distance, were required; and he reminded them that, when he brought the phonograph before the Academy, he had taken the precaution to procure an able operator for the working of it. The point of the reply is that a certain number of the members said that the phonograph was exhibited by a ventriloquist. M. Fizeau, who was in the chair, called the assembly to a vote, and the discussion ended. It was not recorded in the *Comptes Rendus*.

AT the meeting of the Botanical and Horticultural Congress in Paris, the following were among the most interesting communications and discussions:—On the influence of the age of seeds on the plants raised from them. Prof. Baillon found that Prof. Cazzuole's view, that the newer the seeds of *Cucurbitaceæ* the larger the proportion of male flowers, and *vice versâ*, was not confirmed by his own experiments, in which he had sown melon-seeds dating from 1870, and for comparison last year's seeds.—On double flowers. Prof. Morren, in support of his well-known theory of the incompatibility of truly variegated leaves and double flowers, pointed out that in the camellia and *Kerria japonica* normal flowers are only known to occur on variegated stocks. In a Hibiscus, which unites these peculiarities, the flower-buds fall without opening; in a variegated and double wallflower, many of the branches revert and are quite green.—Descriptions were given of the chief botanical laboratories in St. Petersburg, Amsterdam, Florence, and Paris.

In the last city there are no less than four in active work, viz., those of the Sorbonne, École de Médicine, École de Pharmacie, and Muséum (Jardin des Plantes) respectively, besides one for experimental physiology at Vincennes.—On the question of gymnospermy. Prof. Arcangeli's anatomical researches had led him to conclude that the coat of the ovule in Gymnosperms was sometimes carpellary in origin, but not always. Unfortunately no discussion followed.—M. Sirodot gave an abstract of his researches on *Batrachospermum*, which he shows is the sexual form of *Chantransia*.—M. Borodin gave an account of the variations in the excretion of $CO_2$ in leaves of different ages.—M. Millardet found the lesions from phylloxera differ according as the part attacked is the young rootlet or an older part. In the latter case a septum of cork is often formed to preserve the parts that remain healthy. Unfortunately the question of the "Hortus europæus" was hardly discussed, but suggestions were made for the compilation of a new "Steudel." Besides the excursion to Segrez, a large number of members were conducted, on the 22nd, all over the remarkable irrigation works at Genevilliers (where a fourth of the sewage of the city of Paris is utilised), by M. Durand-Claie, Engineer to the Works, and M. H. Vilmorin, Secretary to the Commission d'Etudes. Afterwards many of the foreign members breakfasted with M. E. Cosson, and visited his splendid herbarium, and in the evening was held the banquet of the Congress. On the 23rd a large party visited the gardens of the Jardin des Plantes with Prof. Decaisne, and the herbarium with Prof. Bureau. The final session of the Congress was held at Versailles on the 25th, after which the members visited the show of the Horticultural Society of the town, at whose annual banquet the foreign members were entertained in the evening.

A VERY useful paper "On Lightning Conductors and Accidents by Lightning" was read at the British Association meeting by Richard Anderson, F.C.S. So slow has been the "march of progress" in the application of one of the greatest scientific discoveries of modern times to the uses of daily life, that even now, after the lapse of more than a century, the employment of lightning conductors, simple as they are, and as inexpensive as simple, is far from being general, still less universal. At least one-half, and perhaps two-thirds, of all the public buildings, including the churches and chapels, of Great Britain and Ireland, are without protection against lightning. As to private houses, it is safe to assert that not five out of every hundred have lightning conductors. It is well known that the amount of property destroyed annually by lightning is very great, though it is naturally impossible to form any estimate of it. The terrible losses, both of property and human lives, still occasioned by lightning, are the more lamentable, as they are in nearly all cases the result of the grossest negligence. The negligence is three-fold—namely, first, in not providing any lightning conductors at all; secondly, in not placing them in the right position, or in sufficient number to cover a given area; and, thirdly, in not having them regularly tested, so as to ascertain their constant efficiency. Even some of the first cathedrals of England, such as Peterborough, have no lightning conductors whatever, while others, supplied with them, are insufficiently protected, as is apparent to any competent observer. Mr. Anderson gives striking examples of the absence of lightning conductors, and of the disastrous effects of their being badly placed. The third cause of neglect is by no means the least. Mr. Anderson justly argues that lightning conductors ought to be at regular intervals, at least once a year, carefully inspected, and their efficiency tested by a galvanometer. The absolute neglect of this precaution which is now prevailing is no doubt the cause of a vast number of casualties by lightning, inflicted upon buildings nominally protected by conductors. Utter neglect of the conductor, when once it has been put in its place, is the commonest thing, and indeed the rule, as regards private dwellings; and, we fear, there is little difference in this respect as to most public buildings, churches, and chapels. In fact, it is the old case of a matter of however great consequence, yet being utterly disregarded as "nobody's business." Between three and four thousand pounds were spent in protecting the Houses of Parliament by lightning conductors at the time of their erection, some twenty years ago. Since that time, as far as Mr. Anderson can learn, after minute investigation, they have never been tested, and there is no guarantee whatever that a discharge of lightning may not at any time fall upon the Queen's throne, the Lord Chancellor's woolsack, or the Speaker's chair. A French writer pithily expresses the results that follow from a lightning conductor over a house not having a proper "earth connection," by saying it is lightning guided to the owner's iron bedstead. Mr. Anderson then gives several useful practical instructions as to what ought to be done to amend the present unsatisfactory state of matters, which well deserve attention. As the clock in churches and other public buildings is methodically inspected by the clockmaker, so ought every lightning conductor to be as systematically examined by an electrician or other competent person. Already such a system of inspection and testing of conductors exists in Paris and several other French towns. Shall we say, once again, "They manage these things better in France?"

THE long-expected report of the United States Entomological Commission, appointed to investigate the ravages of the locust, has been published as one of the series of Dr. Hayden's survey, and constitutes a very important addition to the scientific and practical literature on this subject. Although it has been several years since there has been any serious damage caused by the Rocky Mountain locust, their enormous destructiveness, when they do occur in abundance, is such as seriously to threaten the prosperity of the States in which their ravages are prosecuted. The present report professes to be for 1877, and posts the subject up to that date, being a stout volume of nearly 800 pages, and is accompanied by excellent wood-cuts and engravings, representing the insect and its winged and other enemies in all stages of development and condition. In addition to the descriptions of the species and its general natural history, various remedies and devices for its destruction are communicated; also notes on the influence of prairie fires on the increase of the locust, the influence of the weather on the species, the effects which generally follow severe locust injury, and the uses to which locusts may be put. There are also chapters on the ravages of other species of locusts in the United States and on the ravages of locusts in other countries. Congress at the last session provided for the continuation of the inquiry for the present year under the same commission.

MR. W. H. SHRUBSOLE informs us that an imperfect tooth recently found in the London clay at Warden, in the Isle of Sheppey, has been submitted by him to Prof. Owen, who says of the specimen that "it suffices to determine both the mammalian and ungulate nature of the animal it belonged to; that it comes nearest to the kind of *Palæotherium* figured in 'British Fossil Mammals,' p. 322, Fig. 116, but is too incomplete to show the genus or species." Mr. Shrubsole adds that there is no record of any mammalian remains having been found in Sheppey before.

MESSRS. CHURCHILL will publish, early in November, a work on the poisonous snakes of India, by Dr. Ewart, illustrated with coloured plates reduced from Sir Joseph Fayrer's large folio work.

MESSRS. TEGG AND CO., Pancras Lane, will shortly publish "Berkeley's Principles of Human Knowledge," with Introduc-

tion and Copious Explanations, by Collyns Simon, LL.D., author of "The Nature and Elements of the External World," and Proposer of the Berkeleian Prizes in 1848 and 1850.

A NEW book on Ferns has just made its appearance at Salem, Massachusetts, under the title of "Ferns in their Homes and Ours." Its author is Mr. J. Robinson, Professor of Botany, Massachusetts Horticultural Society, and the book forms one of a series called the "American Natural History Series." It has been put together especially for the use of persons residing in the United States, but the author has nevertheless made himself thoroughly acquainted with the works of European pteridologists and pays a high tribute to those of our own country, notably the more recent works of the veteran John Smith. Though the book commences with a consideration of the life-history of a fern, classification, distribution, and nomenclature, it is for its practical part, dealing with the selection and cultivation of these favourite plants in living, that the book will be most valued.

NEWS from Denmark states that the last pillar of the first fixed bridge across the Lim Fjord has now been finished; the new bridge will connect Aalborg on the south side of the fjord, with Norresundby on the north, and it is hoped that it will be opened for traffic during the autumn. Our readers will remember that the Lim Fjord is an arm of the sea stretching right across the Danish continent from east to west.

SOME interesting excavations have been recently made at the "Limburg," a large ruin near Dürkheim in the Bavarian Palatinate, at the instigation of the German Anthropological Society. During 1877 prehistoric remains had been found at this spot, and the work being continued this year, numbers of urns, human and animal bones were discovered, all undoubtedly of prehistoric origin. The most interesting part of the discovery is the laying bare of a cremation ground.

A PAPER on "The Salt Lakes, Deserts, and Salt Districts of Asia," by Mr. Thomas Ward, read before the Liverpool Literary and Philosophical Society has been published separately, with a map. The author endeavours to illustrate from what is known to be going on in the formation of salt at the present time, the way in which salt was formed in past ages.

THE Rev. Thomas Powell, of Upolu, Samoa, writes us that in vol. xv. of NATURE, p. 503, in our report of the Linnean Society, his paper on "Poisoned Spears and Arrows" is represented as having reference to *Samoa*. Mr. Powell sends us a corrected copy of the paper from which we see that the paper has reference to the New Hebrides. The Samoans, Mr. Powell states, have no such custom as the use of poisoned weapons of any kind. They formerly made use of the bow and arrow, not, however, for purposes of war, but of sport only. The introduction of fowling-pieces has abolished the use of the bow. Another error, Mr. Powell writes, into which we have been led is the statement that *Callophyllum inophyllum* was among the trees whose milky juice was used as a poison. This is not Mr. Powell's statement. His informant said that the *Toto* resembled that tree in general appearance. The *C. inophyllum* is a valuable timber tree in common use. Its flowers and fruit are used in Samoa as a perfume. From its fruit an oil is extracted in Fiji, which is useful as a liniment in rheumatism.

THE additions to the Zoological Society's Gardens during the past week include a Banded Ichneumon (*Herpestes fasciatus*) from West Africa, presented by Mr. F. T. Blackley; two Vinaceous Turtledoves (*Turtur vinaceus*) from West Africa, a Greek Land Tortoise (*Testudo græca*), European, presented by Miss Harris; a Common Adder (*Vipera berus*), European, presented by the Viscount Mandeville; a Spotted Turtledove (*Turtur auritus*), bred in the Gardens.

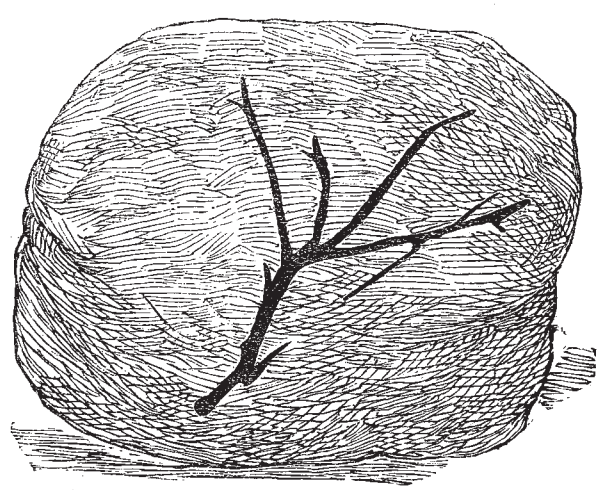
## *A FOSSIL PLANT*[1]

MANY years ago the late Sir William Logan drew attention to the occurrence of fossil plants in the Devonian strata of Canada, and Prof. J. W. Dawson, F.R.S., in the *Quarterly Journal* of the Geological Society, in vols. xv. and xviii., described and figured some of these specimens. Amongst them was a plant which he designated *Psilophytum*. Dr. S. S. Scoville has since discovered the remains of plants in the lower silurians at Longstreet Creek, near Lebanon, Ohio, which Prof. Newberry considered as the casts of some large fucoids or marine plants. Count Saporta has found the branch of a fern in the silurian schists or slates of Angers, France. Prof. Leo Lesquereux, to whom we owe so much for his labours in investigating the fossil plants of the United States, in a paper read before the American Philosophical Society, October 10, 1877, has described and figured a plant from the lower Heldeberg sandstone, Michigan, under the name of *Psilophytum cornutum*.

In a paper read by myself before this society on December 26, 1876, I stated that after some years' search I had not been able to find the *Palæochorda major* mentioned by Professors Harkness and Nicholson as occurring in the Manx schists in such a state of preservation as to be certain of its true nature, but I had a fucoid in my possession found by Mr. Grindlay in the drift near Laxey.

As Mr. Lesquereux's specimen so much resembles the one found at Laxey I shall give his description at length.

"Stem thick, dichotomous, divisions variable in distance, the



terminal ones short, pointed nearly equal in size and length, surface slightly rugose and irregularly striate.

"The branches in the lower part are thick comparatively to their length, three or four millimetres, irregularly striate when decorticated, or merely punctuate upon the thin bark with small projecting dots resembling the basilar remains of scales or small decayed leaves; lateral branches short, narrowed to a sharp point; the upper or terminal ones about equal in length, appearing like a pair of pointed horns."

The species is only comparable to some of the fragments not specified but figured by Prof. J. W. Dawson (Geol. Survey of Canada, Fossil Plants of the Devonian and upper silurian formations, Figs. 243, 244). The author remarks "that these fragments are probably originating in the upper silurian of Gaspé; that as they are found in the lower part of the limestone which underlies the Devonian Gaspé sandstone and become more abundant in the upper beds, this suffices to indicate the existence of the neighbouring land, probably composed of silurian rocks and supporting vegetation."

From the preservation of its branches even to the smallest subdivisions, the specimens here represent part of a plant embedded in the place of its growth. The matrice is a piece of very hard calcareous shale seven to eight millimetres thick, bearing on one side irregular undulations like ripple marks, without any trace of organic remains, and on the other the fragments of plants as figured here. The branch in (*a*) represents a different species,

[1] "Notice of a Fossil Plant found at Laxey, in the Isle of Man," by E. W. Binney, F.R.S., F.G.S., President, paper read at the Literary and Philosophical Society, Manchester.